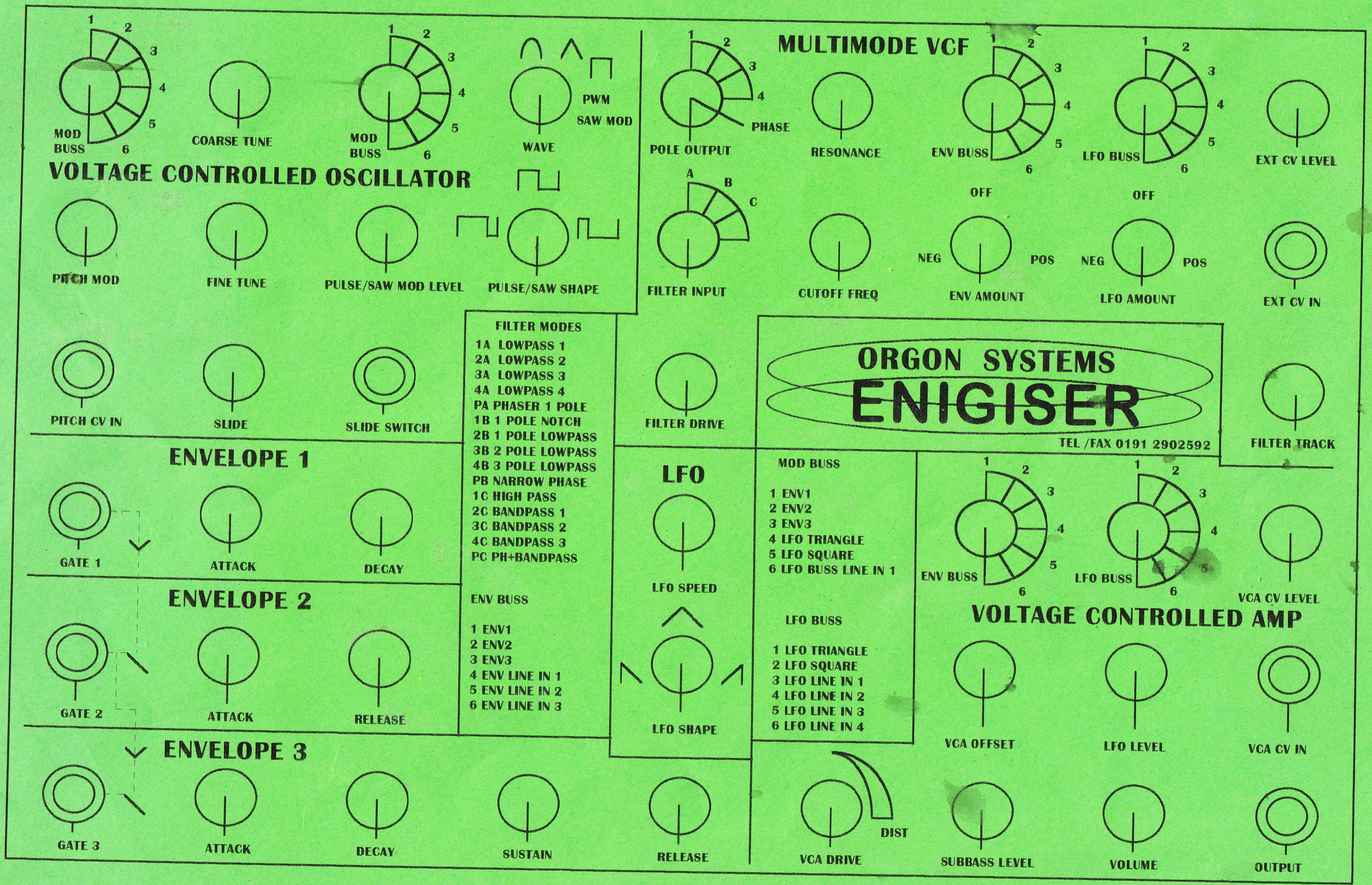

FILTER MODES

1A LOWPASS 1
2A LOWPASS 2
3A LOWPASS 3
4A LOWPASS 4
PA PHASER 1 POLE
1B 1 POLE NOTCH
2B 1 POLE LOWPASS
3B 2 POLE LOWPASS
4B 3 POLE LOWPASS
PB NARROW PHASE
1C HIGH PASS
2C BANDPASS 1
3C BANDPASS 2
4C BANDPASS 3
PC PH+BANDPASS

ENV BUSS

1 ENV1
2 ENV2
3 ENV3
4 ENV LINE IN 1
5 ENV LINE IN 2
6 ENV LINE IN 3

MOD BUSS

1 ENV1
2 ENV2
3 ENV3
4 LFO TRIANGLE
5 LFO SQUARE
6 LFO BUSS LINE IN 1

LFO BUSS

1 LFO TRIANGLE
2 LFO SQUARE
3 LFO LINE IN 1
4 LFO LINE IN 2
5 LFO LINE IN 3
6 LFO LINE IN 4

ORGON SYSTEMS ENIGISER quick start guide

ORGON SYSTEMS
ANALOGUE SYNTHESIS DESIGNS

introduction

ORGON SYSTEMS
ENIGISER

Thank you for purchasing an **ORGON SYSTEMS ENIGISER**.

This manual has been designed as a guide to getting you started with your new synthesiser. We hope these few pages will prove to be a concise introduction into not only the **ENIGISER**, but some rudiments of analogue synthesis itself. You will not be disappointed with the spectrum of sound that the **ENIGISER** can create.

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Page 3 **Enigiser Routings Diagram**
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In the mid 1980's, a lot of large synthesiser manufacturers switched from analogue to digital production. Analogue machines were viewed by many as being impractical: The classic machines have become unaffordable, many of them are unreliable and unstable. Modular synthesis has been perceived as being too complicated and expensive for the average musician. These misconceptions have been put to rest by the **ORGON SYSTEMS ENIGISER**.

With the dance music boom of the late eighties and a renaissance of interest in many 70's synth heavy musical styles, the market has seen a resurgence of interest in analogue technology. Many digitally controlled analogue machines have come onto the market. We believe, however, that the **ORGON SYSTEMS ENIGISER** offers a flexibility and purity of sound impossible to produce on any of these other synthesisers.

The **ENIGISER** has none of the black box mystique of many contemporary synthesisers. It is a hands on machine where every control can be manipulated in real time rather than hiding behind a two line LCD display. It can also be externally controlled in a myriad of different ways. The superb routing options offer the musician an infinite amount of phonic variation meaning that while it is easily possible to replicate vintage analogue sounds it is also a platform to move further out. This manual will help you do just that: Move further out.

We at **ORGON SYSTEMS** are not solely electronic engineers: We are musicians with electronic knowledge and an interest and belief in analogue technology. Every feature of your **ENIGISER** has been tested for musicalty. Thank you for supporting **ORGON SYSTEMS**. We hope you have as much enjoyment using your **ENIGISER** as we have had designing, testing and playing about on it!

ORGON SYSTEMS
ANALOGUE SYNTHESIS DESIGNS

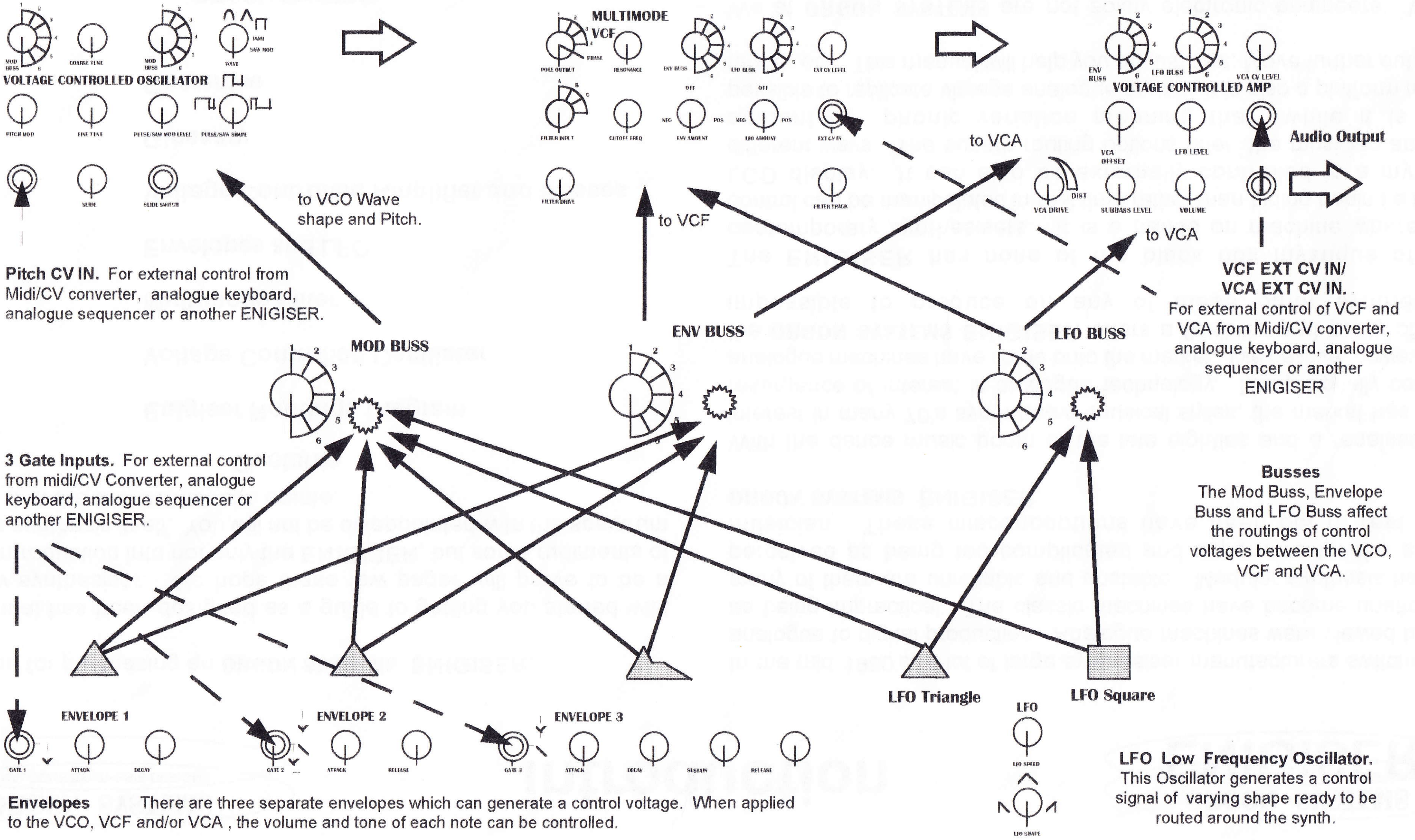
ENIGISER routings

ORGON SYSTEMS
ENIGISER

VCO Voltage Controlled Oscillator.
The VCO is the part of the synth which controls the pitch and generates the basic tone.

VCF Voltage Controlled Filter.
The VCF is used to add treatments to the sound generated in the VCO

VCA Voltage Controlled Amplifier.
The VCA is used to control the Volume(Amplitude) of the signal coming out of the synth



Pitch CV IN. For external control from Midi/CV converter, analogue keyboard, analogue sequencer or another ENIGISER.

VCF EXT CV IN/
VCA EXT CV IN.
For external control of VCF and VCA from Midi/CV converter, analogue keyboard, analogue sequencer or another ENIGISER

3 Gate Inputs. For external control from midi/CV Converter, analogue keyboard, analogue sequencer or another ENIGISER.

Busses
The Mod Buss, Envelope Buss and LFO Buss affect the routings of control voltages between the VCO, VCF and VCA.

Envelopes There are three separate envelopes which can generate a control voltage. When applied to the VCO, VCF and/or VCA , the volume and tone of each note can be controlled.

LFO Low Frequency Oscillator.
This Oscillator generates a control signal of varying shape ready to be routed around the synth.

voltage controlled oscillator

The Voltage Controlled Oscillator is the part of the synth which controls the pitch and generates the basic sound. The unique buss system makes powerful modulation possible and a CV in socket means the oscillator can be externally controlled.

Coarse & Fine Tune Use these controls to get the sound to your desired tuning or pitch. The Coarse Tuning has an approximate range of 8 octaves, the fine tuning, +/- 1 semitone.

Pitch Modulation Buss A six way switch which directs the source of modulation from the envelopes or LFO to the oscillator pitch. The settings are:

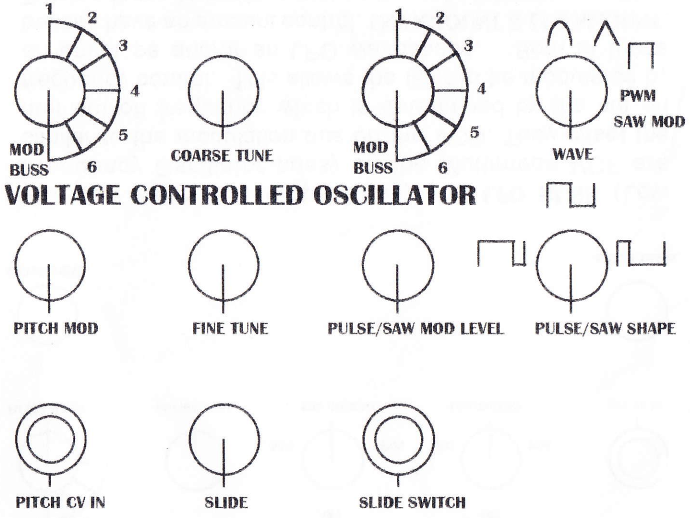
Position 1:	Envelope 1
Position 2:	Envelope 2
Position 3:	Envelope 3
Position 4:	Low Frequency Oscillator Triangle Wave
Position 5:	Low Frequency Oscillator Square Wave
Position 6:	Expansion Port (if patch bay is fitted)

Pitch Mod Controls the amount of pitch modulation.

Pitch CV IN Socket Allows the user to plug a control voltage (CV) from a control source (1 volt/per octave) such as an analogue keyboard or sequencer, midi to CV converter or another Enigiser, thus allowing external control of the oscillator pitch.

Modulation Buss This is a six way switch which directs the source of modulation from the LFO or the envelopes. The settings are:

Position 1:	Envelope 1
Position 2:	Envelope 2
Position 3:	Envelope 3
Position 4:	Low Frequency Oscillator Triangle Wave
Position 5:	Low Frequency Oscillator Square Wave
Position 6:	Expansion Port (Only used if patch bay is fitted)



WAVE Selecter. Here, the user can select one of 5 basic waveforms (although as we shall see later, the intricate routings of the Enigiser make it possible to manufacture many variations of waveforms). The 5 basic settings are sine waves, triangle waves, square waves, pulse width modulated waves and saw shape waves. Each of the different waveforms have their own distinctive character and are outlined in the box at the bottom of this page.

If **PWM** or **SAW MOD** waves are selected, it is possible to employ the following additional controls.

PULSE/SAW SHAPE This modulates the selected waveform.

PULSE/SAW MOD LEVEL This control effects the amount of pulse width and saw modulation applied form the modulation buss.

SLIDE CONTROL Also known as portamento; this effect is obtained by carrying the pitch in a continuous glide from one note to another at a pre determined rate. Adjust the amount of slide control required with this knob.

SLIDE SWITCH Socket which allows the slide control to be switched on or of from an external trigger or gate. Applying a trigger or gate will switch the slide off. A very useful function when used in conjunction with a controller keyboard or sequencer.

5 ENIGISER BASIC WAVESHAPES

Sine Wave This is the most simple wave shape available. It has no harmonics. At low frequencies sine waves appear transparent and at high frequencies they can be very piercing. Sine waves are often used as the basis of flute type tones, heavy sub-bass and test tones (see Close Encounters Of The Third Kind for further information). Filtering will only effect the volume of a sine wave.

Triangle Wave This wave consists of the fundamental frequency plus a small amount of odd harmonics (made up from sine waves). It can produce transparent, hollow tones and is useful for mellow sounds. Filtering will only produce a very subtle effect.

Square Wave This wave consists of the fundamental frequency plus many odd harmonics extending outside the audio range. This sound works very well with a filter. It produces Hollow and very bright tones. Square waves can be used to produce overblown flute sounds and are the waveform behind classic techno bleeps and hollow 303 type bass sounds.

PWM Pulse Width Modulation waveforms consist of the fundamental frequency plus groups of equally spaced harmonics. They can produce reed type sounds and work very well with a filter. Pulse width waveforms, if modulated, can be used for phased or chorus type sounds giving theeffect of timbrel movement. They can also be used to make aggressive tones when the Pulse width is fairly thin (Try off setting the Pulse/Saw shape control.)

Saw Mod Sawtooth waves consist of the fundamental frequency plus every harmonic. They produce aggressive, bright and buzzy tones. They work well with a filter and are suitable for strings and fat bass sounds. (Off setting the Pulse/Saw shape control will smoothly half the pitch of the waveform.

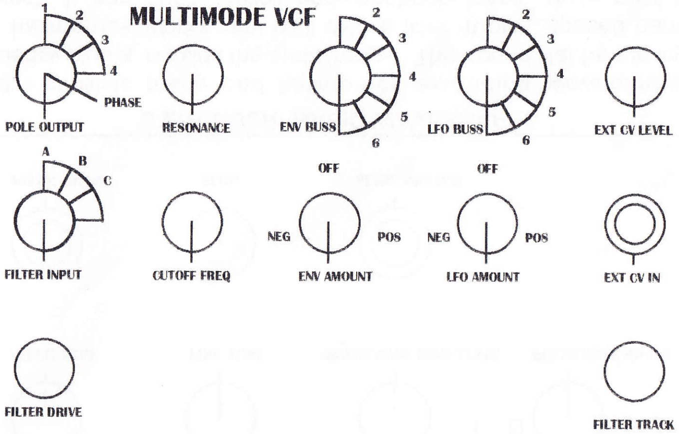
voltage controlled filter

The **MULTIMODE VCF** is used to reshape the waveform created in the VCO, this allows manipulation of the waveform over time. The **ENIGISER** has significantly more filter responses than any other commercially available synthesiser, enabling it to synthesise many unusual, original and amazing sounds.

The Multimode VCF has two main controls: **CUT OFF FREQ** (cut off frequency) which sets the filters operating frequency and **RESONANCE** which boosts harmonics at the cut off frequency (wah wah). Turning the resonance to maximum will make the filter self oscillate which can produce very interesting effects. This is the part of the Enigiser which gives the synth the classic analogue sound.

The 15 responses (Listed on the **ENIGISER** facia), can be broken into 5 main types and can be selected using the **POLE OUTPUT** switch and the **FILTER INPUT** switch. The pole output is labelled 1 - 4 plus phase mode and the filter input is labelled A - C. Therefore selecting a combintion of the two will select the appropriate filter. (Eg 1A = lowpass1)

THE FILTER DRIVE allows the filter to be overdriven or distorted. At zero, there is no signal allowed through the filter. This permits the user to hear the filter self oscillating if the resonance is turned to max without hearing the signal from the VCO. Turning this control up gradually increases the volume until the filter starts to distort (half way). As you turn it up further, the distortion increases. If you don't wish to have a distorted sound, make sure this control is set at 11 O'Clock or less.



The **ENV BUSS** (Envelope Buss) and **LFO BUSS** (Low Frequency Oscillator buss) on the Multimode VCF are similar to the modulation bus on the VCO. They offset the fiter cut off frequency which is determined by the cut off frequency control. This allows the filter to be modulated by an envelope and/or an LFO waveshape. Both of these busses have an amount control; **ENV AMOUNT** & **LFO AMOUNT**. Turning these to positive makes the cut off frequency of the filter increase as the modulation increases (Thus a rising envelope will sweep the filter frequency upwards) and turning them to negative makes the cut off frequency decrease as the modulation increases (Thus a rising envelope will sweep the filter frequency downwards). When the Envelope or LFO amount controls are set to 12 O'Clock no modulation is allowed through.

EXTERNAL CV IN & EXTERNAL CV LEVEL allow an external voltage (0 -10 volts) to shift the filter cut off frquency upwards at the rate of 1 volt per octave when the external CV level is set to max. It is possible to attach a midi to CV converter, analogue keyboard or sequencer, or another Enigser to this socket to externally control the filter. It can also be used as an accent control.

FILTER TRACK works when there is external control of the Oscillator through the Pitch CV in socket on the VCO. This enables the Filter Cut Of Frequency to follow the Oscillator pitch governed by the Pitch CV In Socket. The Cut Off Frequency of the filter will then change at a relative rate to the Oscillator pitch. (if the oscillator pitch increases by 200 Hz when a pitch CV is appied to it, The filter will move by 200Hz also). In simple terms, this means when the filter track control is set to maximum, the filter tracks the oscillator. This is easier to grasp than explain - try it and see!

Routing an envelope is very easy, envelope 1 is found on setting 1 on the envelope buss (as listed on the **ENIGISER** facia under ENV Buss).

Envelope Buss No. 1 = Envelope 1
Envelope Buss No. 2 = Envelope 2
Envelope Buss No. 3 = Envelope 3
Envelope Buss 4,5 & 6 are left spare for the expansion board but can be used as an off position.

Routing the LFO is just as easy: The LFO triangle wave is found on setting No. 1 of the LFO buss, the LFO square wave is found on setting No. 2 of the LFO buss. Settings 3 - 6 are left spare for the patch bay and may also be used as an off

Description of 5 Basic ENIGISER Filter Types

Lowpass A low pass filter attenuates harmonics above the cut off frequency. Turning the resonance up will boost harmonics at the cut off frequency.

Phase Phase shifts harmonics around and above the cut off frequency. This creates a gentle sweeping effect.

Notch Removes harmonics at the cut off frequency. The width of the notch is governed by the resonance control.

Hi Pass Attenuates harmonics below the cut off frequency and passes harmonics above the cut off frequency. Increasing resonance will boost harmonics at the cut off frequency.

Band Pass Passes harmonics at the cut off frequency and attenuates those outside. Increasing resonance narrows band pass response and boosts harmonics at the cut off frequency.

ORGON SYSTEMS
ANALOGUE SYNTHESIS DESIGNS

envelopes and low frequency oscillator

ORGON SYSTEMS
ENIGISER

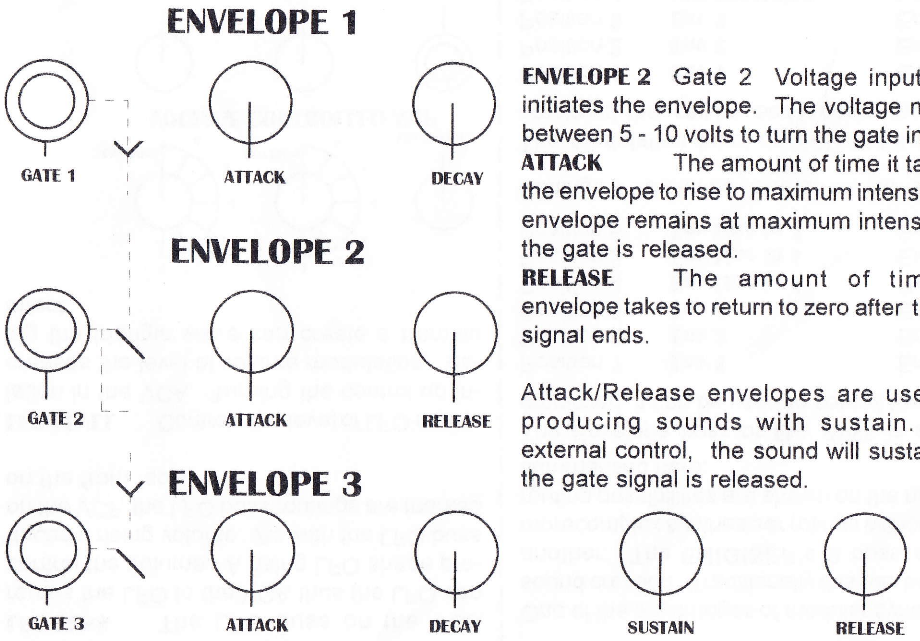
Envelopes

Envelopes are useful for applying control of sound aspects and synchronisation of a control source to either the VCO, VCF or VCA over time. This control is achieved by means of the envelope buss and modulation buss found on the afformentioned sections. You can externally control the envelopes on your **ENIGISER** by use of an analogue keyboard or sequencer or a midi to CV converter.

ENVELOPE 1 Gate 1 Voltage input which initiates the envelope. The voltage must be between 5 - 10 volts to turn the gate input on.
ATTACK The amount of time it takes for an envelope to rise to maximum intensity.
DECAY The amount it takes for an envelope level to fall to 0. On this envelope, the decay is initiated as soon as the attack has reached maximum level.

Attack/Decay envelopes are useful for producing drum type sounds, 303 emulations or any sound that doesn't include sustain: a sort of one shot envelope, with external control, the gate time has no effect on the envelope time.

The Enigiser has 3 separate envelope generators which can be controlled by up to 3 separate control sources. The envelope gate sockets are cascaded in such a way that plugging a control source into envelope one will also control envelopes 2 & 3. Plugging a control source into envelope 2 will control envelopes 2 & 3 and plugging a control source into gate 3 will control gate 3 only. Another possibility is plugging 3 separate gate controls into the gate socket of each envelope, enabling all 3 envelopes to work independently. To add an extra layer of complexity to this scenario, plugging a control source into gates 1 & 3 will mean that gate 1 will control envelope 1 & 2 while gate 3 will control envelope 3. Using the Env Buss with these 3 envelopes gives the user an unprecedented amount of real time analogue control



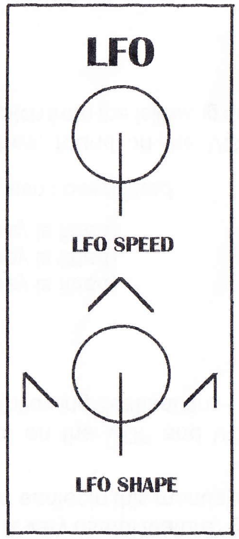
ENVELOPE 2 Gate 2 Voltage input which initiates the envelope. The voltage must be between 5 - 10 volts to turn the gate input on.
ATTACK The amount of time it takes for the envelope to rise to maximum intensity. The envelope remains at maximum intensity until the gate is released.
RELEASE The amount of time the envelope takes to return to zero after the gate signal ends.

Attack/Release envelopes are useful for producing sounds with sustain. With external control, the sound will sustain until the gate signal is released.

ENVELOPE 3 The **GATE 3** Voltage input initiates the envelope 3. The voltage must be between 5 - 10 volts to turn the gate input on.
ATTACK The amount of time it takes for an envelope to rise to maximum intensity.
DECAY The amount of time it takes for an envelope level to fall to the sustain level
SUSTAIN The level at which the envelope is held at while the gate is on (after the attack decay section)
RELEASE The amount of time at which the envelopes returns to 0 level when the gate is switched off.
Attack, sustain decay and release envelopes are useful when mimicking non analogue instrument sounds because they can produce a short burst of sound followed by a variable sustain level and release time.

LFO Low Frequency Oscillator

A repeating modulation source which generates a control signal that can effect the pitch, pulse width and saw shape of the VCO, The cut off frequency of the VCF and/or The volume output of the VCA. This control is achieved by means of the LFO buss and Modulation buss.



LFO SPEED Defines the speed of the control.

LFO SHAPE Defines the shape of the LFO. Tuning this control to the left produces a downward sawshape, while turnig it to the right produces an upward sawshape at the triangle wave output of the modulation buss.

voltage controlled amplifier and buss system

VOLTAGE CONTROLLED AMPLIFIER

The Voltage Controlled Amplifier is used to amplify the sound generated in the VCO and Filtered in the VCF. As you will see, however, the ability to add LFO or envelopes combined with the ENIGISER's in built distortion and seperate subbass control allows the user an amazing amount of flexability of sound control.

ENV BUSS The Envelope Buss on the VCA routes the enelopes to the VCA enabling the envelopes to control the volume of the output. A rising envelope produces a rising volume. As with the envelope buss on the VCF, the envelope buss routings are marked on the front facia. If you turn the buss to an unused envelope line in, it will stop envelopes from reaching the VCA.

VCA OFFSET Turns the VCA on gradually without the need of routing. Can be used to used to produce drones or a constant sustained sound.

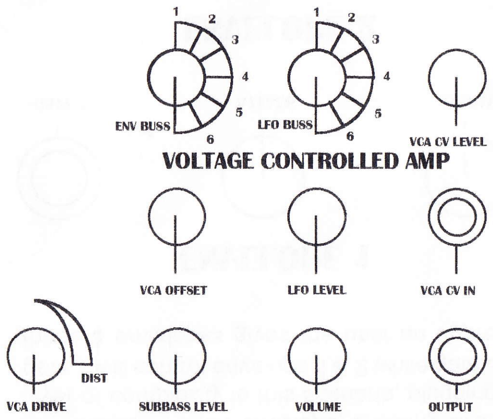
VCA DRIVE. Adjusts the output level from the VCF. Turned up to full will create distortion on the VCA output. A very powerful feature. For undistorted use, set to 11 O'clock.

SUBBASS LEVEL Introduces the fundamental harmonic of the oscillator to the VCA. Set at 9 O'clock, this control will produce an audible Sub bass sound. Sub bass manipulation gives the user the ability to introduce a heavy bottom end to any sound produced by the Enigiser, even those treated with a high pass filter (normally the bottom end in this scenario would be filtered out)

Output Audio Ouput

LFO BUSS The LFO buss on the VCA routes the LFO to the VCA thus the LFO can control the volume. A rising LFO shape produces a rising volume. As with the LFO buss on the VCF, the LFO buss routings are marked on the front facia.

LFO LEVEL Controls the level of LFO modulation in the VCA. Turning the control up increases the level of volume modulation. Using the triangle wave can create a tremalo effect.



VCA CV LEVEL Amount control for VCA CV in.

VCA CV IN Used for External control of the VCA. We reccomend you attach a keyboard, sequencer, midi to CV converter or another Enigser to this socket to externally control the Amp. It can also be used as an accent control.(Accepts 0 -5 volts), the higher the voltage the higher the volume.

Volume Enigiser output level

ENIGISER BUSS SYSTEM

One of the advantages of modular synthesis is the flexibility of routings which can lead to extreme sound creation. Traditionally this has been achieved with patch leads linking one synth module to another. The **ENIGISER's** 3 buss system alows the musician to capture some of these morecomplex synthesiser rotings without the need to repatch: A very useful feature. The various routing possibilities are shown on the routings diagram included earlier in this manual and can be summarised here:

The Envelope buss or **ENV BUSS** is a six way switch, found on the VCF and VCA. When employed, it can be used to control the VCF or VCA from the following destinations-

Position 1	**Env 1**	Envelope 1
Position 2	**Env 2**	Envelope 2
Position 3	**Env 3**	Envelope 3
Position 4	**Env Line In 1**	Expansion port (if patch bay is fitted).
Position 5	**Env Line In 1**	Expansion port (if patch bay is fitted).
Position 6	**Env Line In 1**	Expansion port (if patch bay is fitted).

Settings 4 - 6 can be used as an "off" setting if the patch bay hasn't been fitted.

The Modulation buss or **MOD BUSS** are two six way switches, found on the VCO. When employed, they can be used to control the Enigiser waveshape or pitch from the following destinations-

Position 1	**Env 1**	Envelope 1
Position 2	**Env 2**	Envelope 2
Position 3	**Env 3**	Envelope 3
Position 4	**LFO TRIANGLE**	Low Frequency Oscillator, triangle shape wave.
Position 5	**LFO SQUARE**	Low Frequency Oscillator, square shape wave.
Position 6	**Env Line In 1**	Expansion port (if patch bay is fitted).

Setting 5 can be used as an "off" setting if the patch bay hasn't been fitted.

The Low Frequency Oscillator or **LFO BUSS** is a six way switch, found on the VCF and VCA. When employed, it can be used to control the VCF or VCA from one the following destinations-

Position 1	**LFO Triangle**	Low Frequency Oscillator, triangle shaped wave.
Position 2	**LFO Square**	Low Frequency Oscillator, square shaped wave.
Position 3	**LFO Line in 1**	Expansion port (if patch bay is fitted).
Position 4	**LFO Line in 2**	Expansion port (if patch bay is fitted).
Position 5	**LFO Line in 3**	Expansion port (if patch bay is fitted).
Position 6	**LFO Line in 4**	Expansion port (if patch bay is fitted).

Settings 3 - 6 can be used as an "off" setting if the patch bay hasn't been fitted.

Using the **ENIGISER's** unique 3 buss system, the musician is able to route any control source to any destination with a flexibility usually reserved for a modular system.

glossary

Glossary Of Terms

Amplitude	Volume or loudness of a waveform or sound.
Attenuate	To reduce a level.
Buss	Similar to the 308 bus from Whitley to Newcastle except, it carries modulation from a source to a destination.
Computer	Used to un-convincingly emulate a real analogue synth. Can be housed in a mickey mouse pre patched midi cloned black box wedged full of cheesey pre set predictable crap for the mass market. See Synthesiser.
CV	Control Voltage.
Frequency	The measurement of a waveforms repetition rate. Measured in cycles per second or Hz. 1000 Hz is called 1khz.
Fundamental Frequency	The root frequency of a waveform (perceived as pitch).
Gate	A gate input controls the timing of the envelopes.
Modulation	A control signal which can be used to affect aspects of a synthesiser e.g. make the pitch wobble in sympathy with the LFO waveshape.
Patch	An **ENIGISER** set up
Pitch	Specification of basic harmonic spectrum. The pitch is the fundamental frequency of a waveform. It is also the base of the harmonic spectrum of the waveform. The harmonic spectrum is multiples of the fundamental frequency (pitch). Each harmonic has its own frequency consisting of a sine wave (remember a sine wave has no harmonics). The pitch of a sound is perceived in the listeners mind. Pitch is often thought to be the same as frequency. They are related but are separate properties within a waveform. Pitch is measured in musical notes.
Synthesiser	Orgon Systems Enigiser: a box of analogue electronics with loads of knobs on it which can produce interesting, original and sometimes musical audio textures. Not a mickey mouse pre patched midi cloned black box wedged full of cheesey pre set predictable crap for the mass market. See Computer.
Timbre	The Tone of a sound. Waveforms with different harmonic spectrums can be said to have different timbres.
Workstation	See Computer.

ORGON SYSTEMS

Future plans for **ORGON SYSTEMS** include a rack box with built in midi interface, sequencers, a modular expansion board for the **ENIGISER** and of course some larger and more experimental synthesisers.

Any thoughts, ideas, drawings, particular specifications or suggestions? **ORGON SYSTEMS** are open minded and receptive to new innovation. Please let us know what you think.

This manual was designed and written by Geoff Waterston and Simon Fitzpatrick with help from Steven Brown.

1997 **ORGON SYSTEMS.**

ORGON SYSTEMS ENIGISER

Guarantee

This guarantee is in addition to and does not limit your statutory rights.

The Enigiser is guaranteed against any faults and defects in manufacturing and materials for a period of 12 months from the date of purchas

We will endeavour throughout this period to repair or replace the defective part free of charge for labour and materials - subject to the following conditio

1. The Enigiser has been installed and used correctly and in accordance with the operating instructions.
2. The Enigiser is used and has been used with the power supply specified.
3. The Enigiser has not been taken apart, modified or repaired unless by either ourselves or by a person who is authorised to do so by us.
4. The Enigiser has not been tampered with or otherwise been subject to misuse, fire, accident, lightning, earthquake, volcano, tidal wave landslides, UFO abduction and examination, paranormal activity or negligence.
5. The serial number is intact.
6. The Enigiser, if replaced, shall become our property, as shall any defective part replaced by us.
7. The Enigiser is returned to us or delivered to an appointed representative in its original packing together with proof of purchase.
8. The Enigiser is returned as soon as any defect is found.
9. Any guarantee claim outside the UK is to include prepayment of postal/shipping costs to and from the owner.
10. The sole and exclusive remedy under this guarantee is for the repair and replacement of the unit and no other remedy, including but not limited to incidental or consequential damage or loss of whatsoever nature, shall be available.
11. Our decision on all matters relating to this guarantee claim shall be final.